

29 JUL 1994

Ref: 93-F-2472

Mr. Tod McMahon
GTE Librarian
Command, Control and Communications Systems
GTE Government Systems Corporation
77 "A" Street
Needham Heights, MA 02194-2892

Dear Mr. McMahon:

This responds to your November 1, 1993, Freedom of Information Act (FOIA) request pertaining to MCM-5-91, dated January 15, 1991. Our November 19 letter, your November 29 letter, and our December 13 interim response, refer.

The Joint Staff has provided the enclosed record as responsive to your request.

The administrative cost of processing this request was \$99.45, of which \$51.95 is chargeable. The chargeable cost consists of one hour search, and one hour review, at the professional level rate of \$25.00 per hour; and 13 pages of office copy reproduction at \$0.15 per page. Please indicate our reference number, **93-F-2472**, on a check or money order payable to the U.S. Treasurer in the amount of **\$51.95**. To avoid interest charges, payment must be received in this Directorate within 30 calendar days of this letter's date. Our address is:

Office of the Assistant to the Secretary of Defense
(Public Affairs)
Directorate for Freedom of Information and
Security Review, Room 2C757
1400 Defense Pentagon,
Washington, DC 20301-1400

Sincerely,

SIGNED

D. J. Blakeslee
Acting Director
Freedom of Information
and Security Review

Enclosure

Prepared by Kahn:3F2472L2:7/28/94:DFOI:X71160:gr~~pk~~ylwh

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MCM-5-91
15 January 1991

MEMORANDUM FOR: Distribution List

Subject: Requirement Statement on Tactical-Strategic Networking Capabilities

1. The enclosed document has been validated* and is to be used as the source document for the high-level requirements and architectural guidelines for tactical-strategic networking.
2. ASD(C3I) has been requested, under separate cover, to task DCA to present the program plan to the Defense Data Network (DDN) Executive Committee and to the Commercial Services Industrial Fund Resources Committee for planning within the existing DDN program structure. Those documents will then be submitted to the Director for Command, Control, and Communications Systems, Joint Staff, for formal Service coordination and approval.

For the Chairman, Joint Chiefs of Staff:

A handwritten signature in cursive script, reading "Gene A. Deegan", is positioned above the typed name.

GENE A. DEEGAN
Major General, USMC
Vice Director, Joint Staff

Enclosure

Reference:

- * SM-684-88, 23 August 1988, "Policies and Procedures For Management of Command, Control, and Communications Systems"

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ENCLOSURE

1. Title. Requirement Submission (RS) on Tactical-Strategic
Networking Capabilities, RS 1-90. (Strategic refers to data
communications and automated information systems supporting fixed
locations, not strategic weapon systems.)
2. Brief Description of the Deficiency
 - a. The deficiency inhibits operations.
 - b. Effective and efficient use of joint forces requires
greater vertical and horizontal exchange of information than
is fielded today. Past development of Service or
function-unique networks supporting C2 and information
systems has resulted in the fielding of noninteroperable
equipment, limiting access to critical decisionmaking
information. The unified and specified commands and the
Services are often unable to interconnect automated
information exchange systems at fixed locations into tactical
transmission systems. Interconnection provides access to
national assets for targeting, threat analysis, and adversary
status, to name just a few capabilities. These links must
support all military functional components and provide
protection of the information at the required level of
security, while denying access to those without the proper

need to know. Multiple level security networking must be
extended into various types of tactical transmission media
(systems) to support secure exchange of critical information
among all echelons. The solution should also adhere to
Department of Defense and/or Government Open Systems
Interconnection Profile (GOSIP) and interface standards, NATO
standardization agreements for data communication protocols,
and available international commercial standards to ensure
interoperability among subscribers.

3. Background

a. Historically, each of the Armed Services has developed
communication systems that best meet their individual
tactical requirements. Certain functional areas, such as
intelligence, have instituted their own dedicated
communications systems to maintain the security and quality
of service they require. Fixed networks have been built to
capitalize on the increased speed and capacity brought about
by recent technology. Tactical networks, on the other hand,
have concentrated on specialized hardware and unique
protocols, tailored for their individual applications.
Neither community has taken on the planning for inter-
connection and interoperability. The result has been sets of

communications networks with limited interconnections, for security, procedural, and technical reasons. 1
2
b. Each of the Services has increased the number of 3
computers used as part of their support to strategic, mobile, 4
and transportable communications platforms. In some cases, 5
state-of-the-art packet switched networks are being planned 6
to facilitate the movement of information among these 7
computers in the tactical arena. These developments offer an 8
excellent opportunity to increase the efficiency of data flow 9
to all echelons by interconnecting tactical and strategic 10
networks to achieve more effective connectivity. Greater 11
survivability, interoperability, security, and cost avoidance 12
are also gained by sharing network facilities and services. 13
4. Deficiency of Current or Planned Systems. Requirements are 14
increasing at a rapid rate for the timely exchange of information 15
among computers at tactical echelons, with each other and with 16
fixed systems. In particular, tactical units have a requirement 17
to exchange information with adjacent units, unified command 18
elements, senior echelon components to the Military Services, and 19
with national and allied defense agency information systems. 20
This information exchange must occur in a timely and efficient 21
fashion to support joint and combined operations, intelligence, 22

logistics, and special operations. While large amounts of the information are exchanged within unified commands and Military Service components, critical information often must be exchanged with allied force elements. Further, the information is frequently classified with compartmented caveats; other information is restricted to US-only dissemination or restricted to dissemination within allied organizations. Information is exchanged among computers in a variety of formats, including messages, images, files, and individual data elements. These requirements can be adequately supported only by ensuring that information sent through a given network between two computers, or between two computers attached to different networks, is protected at the proper security level and delivered only to the proper recipient in a timely and efficient manner.

5. Operational Concept

a. Without automated interconnection, many of the benefits computers provide are lost due to the need for cumbersome and awkward manual interfaces. Information from strategic networks cannot be provided instantaneously. As an example, a Tactical Air Control Center (TACC) may not have up-to-the-minute information on the location of enemy air defenses. In fact, they could have relocated since the

latest tactical update while national systems would have that information. Without an automated interface between the tactical and strategic automated information networks, the TACC could vector aircraft into the teeth of the enemy air defenses. This is one example of the threats created by the lack of interoperability between tactical and strategic networks.

b. The core requirements for tactical-strategic networking are complex. In order to take full advantage of the capabilities of tactical automated information systems, it is essential to allow them access to all necessary information in an efficient and timely manner, wherever the source. That capability includes the following characteristics:

- (1) Provide computer-to-computer exchange of data within and across network boundaries where necessary and appropriate. Examples of information passed in actual contingencies are intelligence dissemination, logistics and supply information, mission planning, and AUTODIN data traffic.

- (2) Protect the security of data exchanged between computers using a networking approach able to handle all levels of classification. Initially, physically separate

networks may be required to interoperate with Defense 1
Secure Networks (DSNET) 1, 2, and 3, with transition to a 2
fully integrated network capable of handling all levels 3
of classification. This capability should be developed 4
in conjunction with the effort to combine DSNETs 1, 2, 5
and 3 into one network for classified data transmission. 6
Security provisions for the network will be developed in 7
accordance with established security policy. Combining 8
classified networks will allow more effective use of 9
transmission media. Rather than separate links for 10
systems of different classifications, one packet switch 11
node with fewer trunks can potentially handle all levels 12
of classification. This will free up much needed 13
transmission capacity. Additionally, having a single data 14
switch for various levels of traffic will reduce the 15
amount of information an adversary could obtain through 16
traffic analysis. 17

(3) Minimize management resources required to support 18
connection with those common networks. 19

(4) Minimize resource personnel and equipment require- 20
ments through efficient interface to and application of 21
DCS backbone resources to support common-user tactical 22
internetworking.

(5) Increase effectiveness of operating commands by	<u>1</u>
integrating and networking existing communications	<u>2</u>
systems. The interconnectivity of the network will be	<u>3</u>
mainly at the physical, data, and transport levels.	<u>4</u>
Applications software will be provided on the host	<u>5</u>
systems interconnected by the network. Integrated	<u>6</u>
Tactical-Strategic Data Network (ITDN) protocols must	<u>7</u>
interoperate with those of the Defense Data Network (DDN).	<u>8</u>
(6) Provide a basis for future evolution through	<u>9</u>
application of GOSIP communications and interface	<u>10</u>
standards.	<u>11</u>
c. The operational concept for fulfilling these requirements	<u>12</u>
must:	<u>13</u>
(1) Be based on an internetworking approach, focused on	<u>14</u>
interoperability, which can be implemented in the near	<u>15</u>
term to meet joint tactical information transfer	<u>16</u>
requirements without extensive new development. It will	<u>17</u>
provide the same functionality as DDN, such as	<u>18</u>
multiaddressing and connection to any DDN subscriber host	<u>19</u>
(dial up or direct connect), and comply with DDN security	<u>20</u>
criteria. The basic network must be evolvable to GOSIP	<u>21</u>
	<u>22</u>

protocols, if not available at initial implementation, to 1
allow for interoperability of all Service tactical packet 2
switching networks. 3

(2) Provide a feasible and effective interface between 4
the strategic communications network and tactical 5
networks and allow all tactical networks to use each 6
other's data transport capability. This will be 7
accomplished by employing existing DOD and international 8
communications technology standards. 9

(3) Provide the capability for tactical-strategic 10
networking at multiple security levels. 11

(4) Include network management capabilities that are 12
effective for integrated tactical-strategic networks with 13
network management focused at the component command level 14
and above. Networks and capabilities should be 15
integrated with circuit switch management functions to 16
provide system-level management. 17

(5) Deny the adversary access to the network for 18
interception, deception, traffic analysis, and jamming. 19
These concerns must be addressed in capability 20
development. 21
22

6. Additional Justification. The US Army is deploying mobile
subscriber equipment (MSE) area communications and planning to
provide modern packet switched network overlay service to MSE to
handle efficiently intercomputer information exchange. A similar
approach to overlaying packet switching on tactical
communications systems used to connect echelons above Corps is
also feasible, but requires joint approval of the Military
Services. Headquarters, US Air Force, issued Statement of Need
(SON) 07-89, "Tactical Secure Data Communications (TASDAC)." The
SON states that the Air Force needs the capability to use
available time-sensitive C2, intelligence, and mission support
information to lower echelon operating forces. Within the US
Navy, MROC 2-88 (Tactical Department of Defense Intelligence
Information System) specifically requires connection of afloat
computers to national and/or strategic data bases. The Navy has
also confirmed the applicability of an integrated
tactical-strategic data networking architecture in Navy C3 system
planning objectives to ensure interoperability among future
tactical data systems.

7. Alternatives Considered. Development of an entirely new
capability, in the near term, would be prohibitively expensive.
Attainment of interoperability by enforcement of standards is a
long-term goal to be met through an evolutionary process. For

the near term, the equipment and procedures developed as part of
the ITDN demonstration, conducted in September 1989, should be
considered for adaptation and use as a tactical-strategic
network. ITDN consists of a multimedia, multisystem,
multisecurity level, integrated tactical and strategic packet
switched data communications network. The architecture provides
a data communications infrastructure model, based on
nondevelopmental technology, which transparently supports
multiple security information transfer over a common user
tactical communication network, across multiple tactical
networks, and interconnections with strategic data communication
networks. ITDN is a proven approach that provides a baseline
capability. ITDN concepts and configurations are essentially
ready to be employed. Military Departments and Defense agencies
can begin to develop the necessary guidance to implement the ITDN
capability in their information systems by the early 1990s.
Policy and standards guidance should be developed with capability
to migrate to GOSIP communications and interface standards as a
fundamental requirement. Employing evolutionary acquisition will
be essential. This allows the combatant and supporting commands
to employ current capabilities to satisfy existing requirements
while planning for upgradings to an open systems interconnecting

environment as that technology evolves. ITDN was employed during
proof of concept as follows (this is not all-inclusive):

a. DIA-sponsored integration of packet switches into very
small aperture satellite terminals for potential use as
quick-reaction mobile communications packages.

b. Rome Air Development Center used HF radio to transmit
imagery that was subsequently input into a gateway computer
connected to the ITDN internet.

c. Packet switches were incorporated into tactical trans-
mission systems such as mobile subscriber equipment,
AN/TTC-39A circuit switch, ground mobile forces satellite
terminals and UHF fleet satellite.

8. Priority Category. The capability to establish intercomputer
communications is a critical element of C3I systems and should
have a priority as high as those systems overall.